IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: Prathyusha K. Salla et al.	§	Confirmation No.:	8733
	§	Group Art Unit:	3751
Serial No.: 10/723,858	§		
	§	Examiner:	Manuel, George C.
Filed: November 26, 2003	§		
	§		
For: METHOD AND SYSTEM FOR DETERMINING A PERIOD OF INTEREST USING MULTIPLE INPUTS	§	Atty. Docket:	GEMS:0236/YOD 132958-1
	§		
	§		

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September 24, 2007	Floron C. Faries
Date	Floron C. Faries

APPEAL BRIEF PURSUANT TO 37 C.F.R. §§ 1.191 AND 1.192

This Appeal Brief is being filed in furtherance to the Notice of Appeal mailed on July 17, 2007, and received by the Patent Office on July 23, 2007. The Commissioner is authorized to charge the requisite fee of $500.00, and any additional fees which may be necessary to advance prosecution of the present application, to Account No. 07-0845, Order No. 132958-1/YOD (GEMS:0236).

1. REAL PARTY IN INTEREST

The real party in interest is GE Medical Systems Global Technology Company, LLC, the Assignee of the above-referenced application by virtue of the Assignment recorded at reel 015011, frame 0557, and recorded on August 20, 2004. GE Medical Systems Global Technology Company, LLC, the Assignee of the above-referenced application, as evidenced by the documents mentioned above, will be directly affected by the Board's decision in the pending appeal.

2. RELATED APPEALS AND INTERFERENCES

Appellants are unaware of any other appeals or interferences related to this Appeal. The undersigned is Appellants' legal representative in this Appeal.

3. STATUS OF CLAIMS

Claims 1-72 are currently pending, and claims 21-32, 53-64, 67, 71 and 72 are currently under final rejection and, thus, are the subject of this appeal. Claims 1-20, 33-52, 65, 66, and 68-70 are withdrawn.

4. STATUS OF AMENDMENTS

There are no outstanding amendments to be considered by the board.

5. SUMMARY OF CLAIMED SUBJECT MATTER

The present invention relates generally to the measurement of the overall motion undergone by an object, and more specifically, using multiple sources to identify a period of interest in the motion of an object within a complex system. Application, page 1, lines 6-9. More specifically, the present invention relates to the use of electrical and non-electrical sensory inputs to determine the motion of an internal component in relation to another internal component. Page 3, lines 12-23. The Application contains twelve independent claims, namely, claims 1, 10, 21, 33, 42, 53, 65-69, and 71. Of these, claims 1, 10, 33, 42, 65-66, and 68-69 are withdrawn. Independent claims 21, 53, 67, and 71 are the subject of this appeal, and their subject matter is summarized below. The subject matter of dependent claims 23 and 55 is also summarized.

Claim 21 recites a method for identifying periods of minimal motion. *See, e.g.*, Application, page 4, lines 14-15. The method includes acquiring at least one set of electrical data representative of cardiac motion (e.g., data ECG 84), acquiring one set of non-electrical data representative of cardiac motion (e.g., mechanical cardiogram 86), and one or more data sets representative of respiratory motion (e.g., pulmonary motion waveform 82). *See, e.g.*, page 16, lines 7-17. The method further includes generating a

set of multi-input motion data (e.g., multi-input motion data 72) having the set of electrical data, the set of non-electrical data representative of cardiac motion, and the one or more sets of motion data representative of respiratory motion. *See, e.g.*, page 16, line 7 – page 17, line 9. Finally, the method includes extracting periods of minimal motion (e.g., quiescent period 88) for one of a heart (e.g., cardiac interval of minimal motion 96) and a respiratory organ (e.g., pulmonary interval of minimal motion 98) from the set of multi-input data (e.g., 72). *See* page 16, lines 19-33.

Claim 53 recites a computer program, provided on one or more computer readable medium for identifying periods of minimal motion. *See, e.g.*, Application, page 4, lines 14-15. The computer program includes a routine for acquiring at least one set of electrical data representative of cardiac motion (e.g., ECG 84), acquiring at least one set of non-electrical data representative of cardiac motion (e.g., mechanical cardiogram 86), and acquiring one or more data sets representative of respiratory motion (e.g., pulmonary motion waveform 82). *See, e.g.*, page 16, lines 7-17. The computer program further includes a routine for generating a set of multi-input motion data (e.g., data 72) having the set of electrical data, the set of non-electrical data representative of cardiac motion, and the one or more sets of motion data representative of respiratory motion. *See, e.g.*, page 16, line 7 – page 17, line 9. Finally, the computer program includes a routine for extracting periods of minimal motion (e.g., quiescent period 88) for one of a heart (e.g., cardiac interval of minimal motion 96) and a respiratory organ (e.g., pulmonary interval of minimal motion 98) from the set of multi-input data (e.g., 72). *See* page 16, lines 19-33.

Claim 67 recites an imaging system, including a means (e.g., Figure 1 and items 12, 16, 18, 34, 36, 38, 42, 46) for acquiring at least one set of electrical data representative of cardiac motion (e.g., ECG 84), acquiring one set of non-electrical data representative of cardiac motion (e.g., mechanical cardiogram 86), and one or more data sets representative of respiratory motion (e.g., pulmonary motion waveform 82). *See, e.g.*, page 7, line 31 – page 12, line 15; page 16, lines 7-17; Figure 1. The imaging

system further includes a means (e.g., Figure 1 and items 12, 16, 18, 20, 34, 36, 38, 42, 46) for generating a set of multi-input motion data (e.g., 72) including the set of electrical data, the set of non-electrical data representative of cardiac motion, and the one or more sets of motion data representative of respiratory motion. *See, e.g.*, page 7, line 31 – page 12, line 15; page 16, line 7 – page 17, line 9; Figure 1. Finally, the imaging system includes a means (e.g., 20, 22, etc.) for extracting periods of minimal motion (e.g., quiescent period 88) for one of a heart (e.g., cardiac interval of minimal motion) and a respiratory organ (e.g., pulmonary interval of minimal motion 98) from the set of multi-input data (e.g., 72). *See, e.g.*, page 7, line 31 – page 12, line 15; page 16, lines 19-33.

Claim 71 recites an imaging system (e.g., imaging system 10), including an imager (e.g., 12) configured to generate a plurality of signals representative of at least one of a heart and a respiratory organ. Data acquisition circuitry (e.g., data acquisition circuitry 18) is configured to acquire the plurality of signals. Data processing circuitry (e.g., data processing circuitry 20) is configured to receive the plurality of signals. System control circuitry (e.g., system control circuitry 16) is configured to operate at least one of the imager (e.g., 12) and the data acquisition circuitry 18. An operator workstation (e.g., 22) is configured to communicate (e.g., via various input/output interfaces) with the system control circuitry 16 and to receive at least the processed plurality of signals from the data processing circuitry 20. *See, e.g.*, page 7, line 31 – page 12, line 15; Figure 1.

Also in claim 71, one or more sensor-based motion measurement systems are configured to measure electrical activity indicative of motion of the heart. One or more sensor-based motion measurement systems (e.g., 34, 44, 46) are configured to measure non-electrical activity indicative of motion of the heart. One or more sensor-based motion measurement systems (e.g., 34, 40, 42, 44, 46) is configured to measure electrical or non-electrical activity indicative of the motion of the respiratory organ (e.g., lung). Wherein one or more of the data processing circuitry (e.g., data processing circuitry 20) and operator workstation (e.g., 22) are configured to extract one or more periods of

minimal motion (e.g., quiescent period 88) for one of the heart (e.g., cardiac interval of minimal motion 96) and the respiratory organ (e.g., pulmonary interval of minimal motion 98) from a set of multi-input motion data (e.g., multi-input motion data 72) including at least a set of electrical data representative of cardiac motion (e.g., ECG 84), at least a set of non-electrical data representative of cardiac motion (e.g., mechanical cardiogram 86), and a set of electrical and non-electrical data representative of respiratory motion (e.g., pulmonary motion waveform 82) acquired by the respective sensor-based motion measurement systems. *See, e.g.*, page 16, line 7 – page 17, line 9; Figure 1.

Dependent Claims 23 and 55

Claim 23 generally recites a method, as recited in claim 21, wherein the set of multi-input motion data (e.g., multi-input motion data 72) further comprises one or more sets of motion data (e.g., aggregate motion data 70) for one or more proximate organs (e.g., lungs). *See, e.g.*, Application, page 14, lines 20-30; Figure 2.

Claim 55 generally recites the computer program, as recited in claim 53, wherein the routine for generating the set of multi-input motion data includes one or more sets of motion data (e.g., aggregate motion data 70) for one or more proximate organs (e.g., lungs) in the set of multi-input motion data (e.g., multi-input motion data 72). *See, e.g.*, page 14, lines 20-30; Figure 2.

6. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

First Ground of Rejection:

Appellants respectfully urge the Board to review and reverse the Examiner's first ground of rejection in which the Examiner rejected claims 21-22, 24-32, 53-54, 56-64, 67, and 71-72 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,701,897 (hereinafter "Sano").

Second Ground of Rejection:

Appellants respectfully urge the Board to review and reverse the Examiner's first ground of rejection in which the Examiner rejected claims 23 and 55 under 35 U.S.C. § 103(a) as being unpatentable over Sano.

7. ARGUMENT

As discussed in detail below, the Examiner has improperly rejected the pending claims. Further, the Examiner has misapplied long-standing and binding legal precedents and principles in rejecting the claims under Section 103. Accordingly, Appellants respectfully request full and favorable consideration by the Board, as Appellants strongly believe that claims 21-32, 53-64, 67, and 71-72 are currently in condition for allowance. Furthermore, Appellants believe that the withdrawn claims are also in condition for allowance.

First Ground of Rejection – 35 U.S.C. § 102(b)

The Examiner rejected claims 21-22, 24-32, 53-54, 56-64, 67, and 71-72 under 35 U.S.C. § 102(b) as being anticipated by Sano. Appellants respectfully traverse this rejection. As discussed below, Sano fails disclose at least the feature of one or more sets of motion data representative of respiratory motion.

Legal Precedent

During patent examination, the pending claims must be given an interpretation that is reasonable and consistent with the specification. *See In re Prater*, 415 F.2d 1393, 1404-05, 162 U.S.P.Q. 541, 550-51 (C.C.P.A. 1969); *see also* M.P.E.P. §§ 608.01(o) and 2111. Indeed, the specification is "the primary basis for construing the claims." *See Phillips v. AWH Corp.*, 75 U.S.P.Q.2d 1321, 1326 (Fed. Cir. 2005). One should rely heavily on the written description for guidance as to the meaning of the claims. *See id.*

Interpretation of the claims must also be consistent with the interpretation that those skilled in the art would reach. *See In re Cortright*, 165 F.3d 1353, 1359, 49 U.S.P.Q.2d 1464, 1468 (Fed. Cir. 1999); M.P.E.P. § 2111. "The inquiry into how a person of ordinary skill in the art understands a claim term provides an objective baseline from which to begin claim interpretation." *See Collegenet, Inc. v. ApplyYourself, Inc.*, No. 04-1202, -1222, 1251, at 8-9 (Fed. Cir. August 2, 2005) (quoting Phillips).

Anticipation under section 102 can be found only if a single reference shows exactly what is claimed. *Titanium Metals Corp. v. Banner*, 778 F.2d 775, 227 U.S.P.Q. 773 (Fed. Cir. 1985). Every element of the claimed invention must be identically shown in a single reference. *In re Bond*, 910 F.2d 831, 15 U.S.P.Q.2d 1566 (Fed. Cir. 1990). Indeed, the prior art reference also must show the *identical* invention "*in as complete detail as contained in the ... claim*" to support a *prima facie* case of anticipation. *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 U.S.P.Q. 2d 1913, 1920 (Fed. Cir. 1989).

Furthermore, if the Examiner relies on a theory of inherency, the extrinsic evidence must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. In re Robertson, 169 F.3d 743, 49 U.S.P.Q.2d 1949 (Fed. Cir. 1999) (emphasis added). The Examiner, in presenting the inherency argument, bears the evidentiary burden and must adequately satisfy this burden. *See id.*

Independent Claims 21, 53, and 67

In the present case, the rejection is not appropriate because the prior art reference used to reject the claims does not disclose each and every element of the Appellants' claims. For example, independent claim 21 recites the acts of "acquiring at least one set of electrical data representative of cardiac motion, at least one set of non-electrical data representative of cardiac motion, and one or more sets of data representative of respiratory

motion" and "generating a set of multi-input motion data comprising the set of electrical data representative of cardiac motion, the set non-electrical data representative of cardiac motion, and the one or more sets of motion data representative of respiratory motion." (Emphasis added). Independent claims 53 and 67 recite similar subject matter. The present application discusses such respiratory motion at page 2, lines 3-6, line 32 to page 3, line 2, page 6, lines 5-10, page 12, lines 5-10, and elsewhere. The Sano reference does not appear to discuss or disclose the acquisition or use of such data representative of respiratory motion, as presently recited in claims 21, 53, and 67.

Instead, the Sano reference discloses measuring the velocities of movement of cardiac muscle (heart or blood vessel wall), without reference to respiratory motion. Sano, col. 1, lines 7-11, col. 2, lines 31-37, col. 8, line 40- col. 9, line 16. Indeed, Appellants have been unable to find any instance where the Sano reference discloses or discusses the lungs, the diaphragm, or respiration in even a general sense. Instead, the Sano reference describes the generation and display of images in which movement and velocity information is portrayed, such as by superimposition on a static image. Sano, col. 2, lines 31-35, line 66 to col. 3, line 2, line 14, lines 22-34, lines 46-48, lines 53-57, col. 11, lines 11-17 and lines 55-64. In responding to this deficiency of the Sano reference, the Examiner states that: "Sano clearly suggests motion data comprising an ultrasonic diagnosis apparatus in which velocities of movement of an organ in motion of an object, such as a cardiac muscle of a heart and blood vessel wall, are obtained and displayed and if necessary, on the basis of the velocities, other physical values representing conditions of the movement are calculated and displayed. Respiration is a physical value representing the condition of an organ (lung or diaphragm) in motion and exhibiting a velocity of movement." Final Office Action, p. 3.

The Examiner appears to rely heavily, if not entirely, on the Background section of Sano at col. 1, lines 7-13. However, this passage is not motion data representative of respiratory motion in addition to motion data representative of cardiac motion, as presently claimed. There simply does not appear to be any indication in the Sano reference that cardiac and respiratory motion data are acquired or utilized or that the measurement of

respiratory data is ever even contemplated by Sano. Indeed, the Examiner's entire position appears to be that the technique of Sano *could* be utilized to acquire motion data representative of respiration. This is unquestionably insufficient to support a rejection under 35 U.S.C. §102.

Likewise, the Sano reference appears to be entirely silent as to "extracting one or more periods of minimal motion" as presently recited in claims 21 and 53. Instead, as noted above, the Sano reference generally appears to be directed toward generation of images in which motion is depicted or portrayed, such as by superimposition on other images. Sano, col. 2, lines 31-35, line 66 to col. 3, line 2, line 14, lines 22-34, lines 46-48, lines 53-57, col. 11, lines 11-17 and lines 55-64. Sano is not directed to, and does not appear to disclose, identifying periods of minimal motion from a set of multi-input motion data comprising a set of electrical and non-electrical data representative of cardiac motion and one or more sets of motion data representative of respiratory motion. In support of this recitation, the Examiner has cited to col. 2, lines 47-52 of the Sano reference. Final Office Action, p. 2. However, this passage is devoid of any mention of periods of minimal motion and instead merely references a "minimum detection construction." In view of these deficiencies, the Appellants respectfully request that the Examiner be directed to withdraw the present rejections and allow the present claims to proceed to issuance.

Independent Claim 71

Independent claim 71 recites, among other things, "one or more sensor-based motion measurement systems configured to measure electrical or non-electrical activity indicative of the motion of the respiratory organ." As noted above the Sano reference does not appear to discuss or disclose the acquisition of motion of a respiratory organ. Further, the Sano reference does not appear to disclose, nor has the Examiner pointed out, a sensor-based motion measurement system configured to measure motion of a respiratory organ. As such, the rejection of claim 71 is believed to be deficient.

Further, the Sano reference does not appear to disclose data processing circuitry or a workstation configured to extract one or more periods of minimal motion, as noted above. Instead, this subject matter appears to be entirely absent from the Sano reference. In view of these deficiencies, no anticipation is believed to exist for independent claim 71.

First Ground of Rejection – 35 U.S.C. § 103(a)

In the Office Action, the Examiner rejected claims 23 and 55 under 35 U.S.C. § 103(a) as being unpatentable over the Sano reference. Applicants respectfully traverse this rejection.

Legal Precedent

The burden of establishing a *prima facie* case of obviousness falls on the Examiner. *Ex parte Wolters and Kuypers*, 214 U.S.P.Q. 735 (PTO Bd. App. 1979). To establish a *prima facie* case, the Examiner must show that a combination of references includes *all* of the claimed elements, *and* also a convincing line of reason as to why one of ordinary skill in the art would have found the claimed invention to have been obvious in light of the teachings of the references. *See Ex parte Clapp*, 227 U.S.P.Q. 972 (B.P.A.I. 1985). Moreover, the Supreme Court has stated that the obviousness analysis should be explicit. *See KSR Int'l Co. v. Teleflex, Inc.*, No. 04-1350, page 14 (U.S., decided April 30, 2007). "[R]ejections based on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." *See id.* (quoting *In re Kahn,* 441 F.3d 977,988 (Fed. Cir. 2006)).

Deficiencies of the Rejections

Applicants note that claims 23 and 55 depend on independent claims 21 and 53, respectively. As discussed above, the Sano reference fails to disclose each element of independent claims 21 and 53. As a result, dependent claims 23 and 55 are allowable on

the basis of their dependency from a respective allowable independent claim, as well as for the subject matter separately recited in these dependent claims.

Furthermore, Applicants contend that claims 23 and 55 are not obvious to one having ordinary skill in the art. The Examiner's contention in rejecting claims 23 and 55 rests on the notion that it would have been obvious to one having ordinary skill in the art to modify the system as taught by Sano to apply to different types of organs. This, however, is not the subject matter recited in independent claims 23 and 55. Instead, claims 23 and 55 recite the acquisition of "one or more sets of motion data for one or more proximate organs." (Emphasis added). The referenced passage from the Sano reference, however, appears to merely indicate that the disclosed system can image tissues and organs other than cardiac tissue. Such a teaching merely indicates that organs other than the heart can be imaged but does not suggest, teach, or imply that motion data for one or more proximate organs is acquired or used in any manner. Accordingly, Applicants respectfully request withdrawal of the present rejection and allowance of claims 23 and 55.

Conclusion

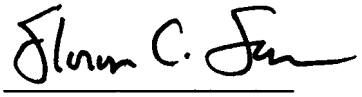
Appellants respectfully submit that all pending claims are in condition for allowance. However, if the Examiner or Board wishes to resolve any other issues by way of a telephone conference, the Examiner or Board is kindly invited to contact the undersigned attorney at the telephone number indicated below.

General Authorization for Extensions of Time

In accordance with 37 C.F.R. § 1.136, Applicants hereby provide a general authorization to treat this and any future reply requiring an extension of time as incorporating a request therefore. Furthermore, Applicants authorize the Commissioner to charge the appropriate fee for any extension of time to Deposit Account No. 07-0845, Order No.132958-1/YOD (GEMS:0236).

Respectfully submitted,

Date: September 24, 2007



Floron C. Faries
Reg. No. 59,991
FLETCHER YODER
P.O. Box 692289
Houston, TX 77269-2289
(281) 970-4545

8. APPENDIX OF CLAIMS ON APPEAL

21. A method for identifying one or more periods of minimal motion, comprising the steps of:

acquiring at least one set of electrical data representative of cardiac motion, at least one set of non-electrical data representative of cardiac motion, and one or more sets of data representative of respiratory motion;

generating a set of multi-input motion data comprising the set of electrical data representative of cardiac motion, the set non-electrical data representative of cardiac motion, and the one or more sets of motion data representative of respiratory motion; and

extracting one or more periods of minimal motion for one of a heart and a respiratory organ from the set of multi-input motion data.

22. The method, as recited in claim 21, wherein the one or more sets of data representative of respiratory motion comprise at least one of a set of electrical data representative of respiratory motion and a set of non-electrical data representative of respiratory motion.

23. The method, as recited in claim 21, wherein the set of multi-input motion data further comprises one or more sets of motion data for one or more proximate organs.

24. The method, as recited in claim 21, wherein the step of acquiring comprises measuring a set of electrical data representative of cardiac motion using electrical sensors.

25. The method, as recited in claim 21, wherein the step of acquiring comprises measuring a set of non-electrical data representative of cardiac motion using mechanical sensors.

26. The method, as recited in claim 21, wherein the step of acquiring comprises measuring a set of electrical data representative of respiratory motion using electrical sensors.

27. The method, as recited in claim 21, wherein the step of acquiring comprises measuring a set of non-electrical data representative of respiratory motion using mechanical sensors.

28. The method, as recited in claim 21, wherein the step of acquiring comprises measuring one of cardiac motion and respiratory motion from one or more images.

29. The method, as recited in claim 28, wherein the one or more images are derived from one of pre-acquisition image data, unreconstructed acquisition image data, and reconstructed acquisition image data.

30. The method as recited in claim 21, further comprising the step of determining a set of motion compensation factors from the one or more periods of minimal motion.

31. The method as recited in claim 21, further comprising the step of determining two or more gating points from the one or more periods of minimal motion.

32. The method as recited in claim 21, further comprising the step of validating the one or more periods of minimal motion.

53. A computer program, provided on one or more computer readable media, for identifying one or more periods of minimal motion, comprising:

a routine for acquiring at least one set of electrical data representative of cardiac motion, at least one set of non-electrical data representative of cardiac motion, and one or more sets of motion data representative of respiratory motion;

a routine for generating a set of multi-input motion data comprising the set of electrical data representative of cardiac motion, the set non-electrical data representative of cardiac motion, and the one or more sets of data representative of respiratory motion; and

a routine for extracting one or more periods of minimal motion for one of a heart and a respiratory organ from the set of multi-input motion data.

54. The computer program, as recited in claim 53, wherein the one or more sets of data representative of respiratory motion comprise at least one of a set of electrical data representative of respiratory motion and a set of non-electrical data representative of respiratory motion.

55. The computer program, as recited in claim 53, wherein the routine for generating the set of multi-input motion data includes one or more sets of motion data for one or more proximate organs in the set of multi-input motion data.

56. The computer program, as recited in claim 53, wherein the routine for acquiring measures a set of electrical data representative of cardiac motion using electrical sensors.

57. The computer program, as recited in claim 53, wherein the routine for acquiring measures a set of non-electrical data representative of cardiac motion using mechanical sensors.

58. The computer program, as recited in claim 53, wherein the routine for acquiring measures a set of electrical data representative of respiratory motion using electrical sensors.

59. The computer program, as recited in claim 53, wherein the routine for acquiring measures a set of non-electrical data representative of respiratory motion using mechanical sensors.

60. The computer program, as recited in claim 53, wherein the routine for acquiring measures one of cardiac motion and respiratory motion from one or more images.

61. The computer program, as recited in claim 60, wherein the one or more images are derived from one of pre-acquisition image data, unreconstructed acquisition image data, and reconstructed acquisition image data.

62. The computer program, as recited in claim 53, comprising a routine for determining a set of motion compensation factors from the one or more periods of minimal motion.

63. (original) The computer program, as recited in claim 53, comprising a routine for determining two or more gating points from the one or more periods of minimal motion.

64. The computer program, as recited in claim 53, comprising a routine for validating the one or more periods of minimal motion.

67. An imaging system, comprising:

means for acquiring at least one set of electrical data representative of cardiac motion, at least one set of non-electrical data representative of cardiac motion, and one or more sets of data representative of respiratory motion;

means for generating a set of multi-input motion data comprising the set of electrical data representative of cardiac motion, the set non-electrical data representative of cardiac motion, the one or more sets of motion data representative of respiratory motion; and

means for extracting one or more periods of minimal motion for one of a heart and a respiratory organ from the set of multi-input motion data.

71. An imaging system, comprising:

an imager configured to generate a plurality of signals representative of at least one of a heart and a respiratory organ;

data acquisition circuitry configured to acquire the plurality of signals;

data processing circuitry configured to receive the plurality of signals;

system control circuitry configured to operate at least one of the imager and the data acquisition circuitry;

an operator workstation configured to communicate with the system control circuitry and to receive at least the processed plurality of signals from the data processing circuitry;

one or more sensor-based motion measurement systems configured to measure electrical activity indicative of the motion of the heart;

one or more sensor-based motion measurement systems configured to measure non-electrical activity indicative of the motion of the heart; and

one or more sensor-based motion measurement systems configured to measure electrical or non- electrical activity indicative of the motion of the respiratory organ;

wherein one or more of the data processing circuitry and operator workstation are configured to extract one or more periods of minimal motion for one of the heart and the respiratory organ from a set of multi-input motion data comprising at least a set of electrical data representative of cardiac motion, at least a set of non-electrical data representative of cardiac motion, and a set of electrical or non-electrical data representative of respiratory motion acquired by the respective sensor-based motion measurement systems.

72. The imaging system as recited in claim 71, wherein a sensor-based motion measurement systems configured to measure non-electrical activity indicative of the motion

of the heart and a sensor-based motion measurement systems configured to measure non-electrical activity indicative of the motion of the respiratory organ are the same.

9. APPENDIX OF EVIDENCE

None.

10. APPENDIX OF RELATED PROCEEDINGS

None.